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BIRD-KILLING AS A METHOD IN ORNITHOLOGY.

BY

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NOTICE.

To the precepts of the following paper two chief objections have been raised: 1. That the subject is not of much importance in the present practice of ornithology. 2. That no ornithologist will feel any sympathy ~~for~~ with the writer's extreme position.

In regard to objection 2, the writer would explain that that is just why the paper has been written. It is high time an ornithologist should acquire such sympathy. And the writer can think of no method other than straightforward exposition by which a knowledge of such views as these, the necessary preliminary to sympathy with them, could possibly be afforded. If the literary manner of the paper seems awkward or difficult as has been hinted, it is at any rate most painstakingly precise, explicit and sincere, and therefore should not be repellent to a scientific mind. Something might be gained, moreover, if any reader who is, in advance, an individualist in his natural history should skip the careful proof of that position on pp. 1–7 and begin with the practical deductions of the subsequent paragraphs. But in the writer's own opinion, individualism of the writer's type still stands in need of proof before the general reader and may indeed be a bone of contention.

Then, in regard to objection 1, the writer would refer for evidence to the current number of The Auk, let us say, Oct., 1901, where of the 8 leading articles 6 involved in their preparation the killing of birds, 1 probably did (art. on p. 347) and the other did not only because it is an account of a bird-search which never found its victim. And of the 18 General Notes, 2 specially apologize for not killing their birds, 1 or 2 are non-committal and 10 are written mainly to record the killing of their subject-matter.

BIRD-KILLING AS A METHOD IN ORNITHOLOGY.

I HAVE been waiting in the hope that some leading ornithologist would make a purely scientific plea against purely scientific bird-killing. But, so far as I have noticed, such a brief has not been forthcoming. And it is time that some layman should sketch out the essay. A few of its points I have already discussed with several scientists. I wish now to lay the argument barely and formally before the main body of American ornithologists through the courtesy of the distributers of The Auk.

It might almost seem that one could begin with the assumption that the killing of a bird reduces the natural field or subject-matter of ornithology by the specific bird in question, with all its qualities or characteristics, except as matter of history, let alone all his or her possible further descendants, their qualities or characteristics; and is in this respect deplorable unless history is natural science. Yet of course such an assumption would be untrue; inasmuch as the characteristics of the corpse of a bird have standing in the science; a standing concerning whose worth we shall be forced to argue. But I think nevertheless that there is a body of scientists, fortunately decreasing, who, formally or informally, explicitly or by tacit implication, assume that the killing of a bird-individual does not *in any way whatsoever* affect the qualitative subject-matter of ornithology, cannot transfer from the quick to the dead any scientifically characteristic object. However few persons would positively assert that the species, subspecies or type[1] (at any rate some collective bird-sort) is actually in a single or plural instance flying about outdoors, nevertheless more scientists than would readily admit it do approach their study with the assumption that *within* the species, subspecies, variety, type or collective bird-sort the particular bird is a mere instance whose sole standing is numerical. Just in so far as such a generico-specific bird-sort is the topic of our science, or as such a bird-sort enters into the definition of our topic, must the strictly logical scientist treat the instance, alive or dead, as merely an instance or unit, not in any wise qualitatively distinct from each and all other instances; whence, except for local scarcity-value in all its bearings, indifferent to the science so long as any other instances remain, alive or dead. Practically, indeed, the bird is better dead, inasmuch as all supposedly fixed or rigidly classifiable single characters by whose combination it is an instance of a permanently definable type are structural in the skeleton or in externals. Whence, alive or preferably dead, the instance is numerical only; and the number, unless it is very small, theoretically indifferent. And the type is exemplified almost indifferently whether by dead or living specimens. But I wish to point out, as is of course well known, that a perfectly strict type-science, to which life is negligible and the number of iterations or instances indifferent, cannot even be rigidly stated without contradiction. Every bird has a scientifically characteristic or unique value, or is in the last resort an individual; and that value is different as between alive and dead.

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[1] To avoid misunderstanding let me say at once that a single type- or standard-specimen is primarily an individual bird like any other; and is a "type" only inasmuch as it is considered to be a somewhat to which others approximate for their explanation. The others in so far as they are considered to exhibit standard characters identical with those of the "type" are purely instances of the type, and otherwise considered (for instance, in their distinction from the standard individual) are purely individuals. But the standard is, except for other alleged equivalent instances known or demonstrable, *not* defined as a type and not in the text considered as such.

For, no value can be "merely numerical" in the sense that characteristics or qualities are indifferent to the distinction thus drawn between instances. A strictly qualitative (if comparatively unimportant) difference exists between an instance of a type which contains 1000 and an instance of a type which contains 1001. In terms of type-character the value inherent to either and each one of only two known or demonstrable instances is the entire type-value, with the addition of a third it is 50% of the type-value; without either one of the two the entire type-value would be zero, as no sole bird can be a collective sort or type, not even by according him such "rank" in virtue of extreme abnormality of osseous structure, etc.; for such abnormality merely sums up a line of ancestral instances, thereby demonstrated and, in the bird for proxy, denominated a genus. Whence, though the qualitative value decreases for each bird with the increase in numbers, the quality is always, even on this low arithmetical plane of argument, a fundamental property so long as the type is a value; and may be exhaustive of the type. There is therefore no "merely numerical" status. For the type inheres, even numerically taking them, only in its instances.[1]

Typehood may thus well be a character of every bird known or demonstrable, alive or dead, but each bird even as a unit is also unique in the sense that his addition to or subtraction from the aggregate alters the type in every single one of its other instances by making the characteristic exemplification by each such instance less or greater, while nevertheless such remaining instance is otherwise unaffected in typical character. And if the type is to be permanently definable, this contradiction can be avoided only by limiting the type absolutely and in all respects to a single instance, in which case we have not a type but an individual. Wherefore the identifiable type (one which is liable to new instances) is never permanently definable.

For of course this statement is so confused because I have continued to assume, while proving a type in terms of almost pure quantity to be qualitatively extremely variable, that the type as definable is qualitatively permanent. It is indeed absurd to say that of three birds each is 50% of a scientific object; of two, each is the whole of the object; but that one alone is no such object at all. Yet this arithmetic of the permanently defined qualitative type is correct. It is the permanent qualitative type (or type unaffected by its instances) which is wrong, as we well know. The qualitative type being inherent only in individuals whose definition, even as units, depends that of each on all others, is extremely variable; varying with every mutation whatever in bird-life. Even the almost pure quantitative instance thereof (the mere unit) is more than a mere unit; being by its presence or absence also a modification of the type; a modification which may even be from infinity to zero of every character or quality in a single residual instance! A permanently definable or invariable type can thus have no instances whatever; and genuine "instances" are examples each of unique qualitative self-identity whose defining relations are consistent with each other or constitute a series or system. Such examples of uniqueness in a system are the objects of ornithological science. They may be taken numerically in the province of statistics; or by some more adequate and important, some more qualitative, standard. But are never mere instances of a mere type or sort.

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[1] The question of existence nowhere enters into my argument, inasmuch as "birds" which alive or dead never do exist or cannot be demonstrated to be about to exist or to have existed are not birds in any sense, scientific or otherwise. For a failure to demonstrate is proof of incompatibility with intelligible world-order lurking in the alleged "definition"; and any figment of fancy (the "perfect," "ideal," "typical bird") fails of actuality just by its wantonly insufficient identification.

We have thus on the basis of strict arithmetic cleared the ground of the possibility of there actually being any permanently definable classes, species, types, or collective bird-sorts for intelligible experience, sensuous or rational. I can now add as a matter of common sense that if a bird admittedly have any characteristic or quality of its own (is something else than the above inconceivable "mere unit") such a character *in that bird in which alone it is actual*, is not identically the same as any character whatsoever in any other individual bird. One may not care to distinguish it by name, but one always does distinguish it in meaning just so far as "it" has a meaning. Of course one's definition or knowledge may always grow more discriminating, and in so doing detect that the newly obsolete degree of knowledge can in the light of the better learning refer only to an impossible or abstract character obviously applicable *if to any*, then just as well to more than one instance. But such is then automatically a rejected definition, from which our new discrimination has moved on. The class-character is precisely what we do *not* assert of any bird; and is therefore a repository for worn-out information, or (what is the same thing) an abstract schema for pigeon-holing distinct characters which we are not interested to define elaborately enough for our own present satisfaction. The type is thus a means of approach, ready reference, nomenclature, etc., in situations where we acknowledge our better information to be for the moment incommunicable to others. It is a shorthand statement of the fact that many birds *are closely related to* an abstracted and well-known bird. In this meaning it is a means of pedagogy, dissemination, etc., not an assertion of one's individual belief, or credible experience in birds.

What we credibly know of birds, is, then, that each as an object of experience or subject-matter of strict science is a unique qualitative self-identity whose defining relationships constitute a system. What is the effect of this definition on the scientific killing of birds? 1. Is it indifferent whether the bird studied is living or dead? 2. If not, do the pedagogic advantages of exemplifying a fixedly definable classification as an ellipse for subtlety of distinction within a group outweigh the practical falsity of such a teaching as a general scientific dogma, solely with regard to its evil effects upon scientific bird-life? 1. Are birds scientifically the same birds, whether living or dead? Only on the supposition that characters of identification are conceptually fixed, and hence, biologically speaking, approximately osseous or perhaps dermal. But if, as above proved, the type-character, because actually of necessity referable to instances, is not fixed, then, à fortiori, no character whatever of any bird or group of birds[1] *whose instances are identifiable* is fixed for a moment. Biologically speaking, then, we must insist on a physiological metabolism through and through in our scientific subject-matter. But physiologically metabolism ceases at death. We then have certain bacterial and fermentative or chemical metabolisms of decomposition with which no ornithologist has any special concern. At death is his opportunity, to be sure, to examine the record of what has very recently gone on in the bird's viscera, especially with relation to food-supply and mating. These examinations however are perhaps points in the criminology of curiosity, and are open, as a special subdivision of collecting, to all the objections below detailed in comparison with observation of food-supply and mating in life.[1] But the skeleton, skin, etc., which are the main characters of a bird who has been dead for any length of time, are so slow in their physiologic metabolism that (with the aid of preservatives) they will not perceptibly alter even chemically or mechanically in a man's lifetime. The interest in them is not in their decay but in their historical accuracy as chronicle of an inferred obsolete actuality. And of course the defence here is that we have metabolism permanently chronicled for enriching our experience of the individual bird. But however this may be (and this I shall consider below) the question of the relative scientific value of the quick and the corpse is no longer debarred. It does make a difference of some sort to the strictest science whether or no the object thereof is alive or dead. In one case the subject-matter or metabolic focus is present to experience in a form more or less available, but surely original; in the other it is inferred ex post facto from marks which may or may not be correctly interpretable; the interpretation to the psychologic or personal bird being doubly indirect. There being such a difference, what are its practical bearings?

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[1] Obsolete birds are not identifiable except in the very small degree (as explained below) in which skeleton by its slight plasticity in mature life chronicles its own contemporary individual. By the skeleton as a fixity or "dead hand" in life, the only chronicle is of a generalized series of ancestry, none of whose instances are identifiable as individual birds, unless by other sources of information.

2. In the first place, a ceaseless metabolism needs an infinite number of chronicles if the chronicle is to be appropriate or sufficient. Whereas the metabolic bird in life is the spontaneous source of interminable unique truths for science, a science dependent upon permanent chronicle can attain any portion of this experience only by stopping the source of it altogether; and will then have for its subject-matter only that literally infinitesimal fraction of bird-life represented by the visceral, osseous and dermal condition (never for two successive moments, especially in

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[1] Specifically, the very rapid digestion of birds, especially of insect food, (taken in connection with wide individual range in appetite) restricts the information obtainable to a minimum and almost provokes mistake *especially* as to negative testimony. A record, to be worth anything appreciable, must contain a shockingly vast quantity of stomachs. Whether current records err most by generalization from insufficient data (*all* seasons, *all* hours, *all* localities are needed!), or in too costly slaughter, would be hard to say. There are many devices by which food (and mating) can be readily and correctly observed in the life. Note the admirable recent study of the disgorgings of certain owls.

the viscera, the same precisely) of each bird at the moment of his death; from which to infer the infinite metabolism of each. It will never obtain any more than this infinitesimal, abstracted from a previous subject-matter. And any bird escaping the slaughter will be lost to science. Yet all this self-defeat is logically the outcome of any unrestricted preference for study of the dead bird, once the actuality of the type-bird has been disproved. And indeed there is at present a surprising tendency among scientists to kill birds under just such an assumption that infinite exhibits are ideally the goal.

Thus, so long as the type-theory held good, it was a legitimate and feasible undertaking, perhaps, to exhibit some example of every one of the definite number of types acknowledged. It still is so, for purposes of ellipsis or pedagogy. But such a collection is no longer relevant to the study of bird-metabolism; as most collectors practically acknowledge. For there is now, correctly enough, no limit in the collectors' eyes except in available birds (or extrinsic considerations) to the numbers *needed* for chronicling variability. Whether or no other considerations deter the collecting, every living bird is a variation from all others, and no collection is complete without him. The arrangement of variations in large graded series, exhibitive of tendencies, is more and more painfully incomplete the more we realize that live birds still remain to tend into new serial variations. Some pretence is still made in serial collections that a limit to numbers is not per se a failure. But this contention is a relic or avowed admixture of the type-standard, limiting the possibility of novelty to predetermined ranges. Whereas, the more accurate is one's discrimination in the matter, the more obvious it is that the entire collection is a series, whose gaps in the known are continuously filled with demonstrable ancestral forms; but whose "beyond" or "indemonstrable" is the living bird. It is mere common sense to say that there is no limit, so long as a single bird or pair remains alive, to the actual insufficiency of the modern serial collection as a chronicle of tendencies. The scheme is per se a flat failure unless all birds are killed. Wherefore a collection cannot be justified at all except on the obsolete type-scheme; a scheme whose pedagogic value disappears with any undue multiplication of types[1] in pretence of appropriate chronicle.

Finally, for the benefit of those who might laugh at my bugbear of the logically complete chronicle, I wish to point out that in the restricted or tempered working of the collecting habit, where the "unattainable goal" is agnostically (i. e. unscientifically) foregone, the acme of acquisition is no longer the "typical" or commonplace, "perfect" or humdrum specimen, one of the rank and file, from whom little of bird-genius could be expected; but, on the contrary, it is more and more the leader of birds, the innovator in every mode of life, the genius and saving hope of the bird-world which is of importance to the chronicle. In the vast, sudden, and, for the birds, deplorable transformation of our continent during the present times, the only hope for a permanent continuance, a development, of the metabolic subject-matter of ornithology lies not in the conservatives of the bird-world, who come to the same old spots at the same old times and do the same old things till they starve, freeze, die of disease or cats with stoic blindness to the necessities of the case. These dullards, commonplace in plume and form, in voice and brain, were once and are still for typical or pedagogic ornithology the objects of collection. But what are now those objects for the progressive and enterprising student? — read in the pages of the Auk. Let a bird be "never here or at this time seen before," let him display "a surprising plumage"; feed on "astonishing things"; sing an "original song"; build a "unique nest"; bring out "an unusual brood"; be, in fact a chance of salvation to his race — and he is a dead bird at sight. His corpse will chronicle a new event; his identity will be "scientifically verified" — by proof that he is nothing before known! And his death may have cost the world the life of a billion feathered migrants, feeders, singers, builders and breeders in the new conditions; his continued life being the only chance for just such guidance and posterity. Speaking with strict scientific meaning, this sort of killing, encouraged as I know by almost all leading ornithologists,[1] even those most active in avowed bird-protection, is scientifically intolerable. Barring the slight chance that the innovating bird is by his own eccentricity immediately doomed (and this consideration almost never enters into the causes of killing) the killing of any such bird is a suicide of ornithology. The scientific spirit cannot speak too strongly in protest. Thus far it does not seem to have spoken to this point at all.

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[1] For a brief statement of what constitutes a reasonable number of types see F. M. C. in Bird Lore, Feb., 1901. This reasonable number of course tends to increase; but should never be pushed to keep pace with contemporary discoveries of variation in life.

Thus we see that any killing of birds, except for the exemplification of an obsolete or pedagogical type-schema, operates, if tempered, to the destruction of all bird-genius and kindred valuable originalities; and is in any case a flat failure unless exhausting all birds in the world; the better our discrimination, the worse being the failure. And this "unattainable goal" would itself be infinitesimal in its relation to the subject-matter for which it would be substituted. Any bird-killing at all (except for pedagogy to a very limited extent) is destructive of ornithological science as a comprehension or appreciation of an actual metabolism.

The chronicle system, then, works badly on the subject-matter which it chronicles, either to its incalculable and cumulative crippling, or even to the entire destruction thereof. Is it per se a reliable chronicle? Not if any other source of information is obtainable. For in themselves bones, horny substances and feathers, by no means permanent for any purpose, are merely the least susceptible, least plastic or least impressible of chronicles and thus the least reliable. What bones record is a long general sweep of customary or habitual and slightly varying ancestral performances. Their influence on living activity is that of the "dead hand" almost entirely. They are, except in so far as every new individual slightly modifies them every moment, the presence of generality or type-character; and are therefore, *except as slightly plastic*, not the actual bird at all. Bones are the closest possible approach to complete irrelevance and incapacity as chronicle of the bird killed. They refer in the main, though very vaguely indeed, to previous birds; and are thus of archaeologic importance chiefly and of a pertinence to contemporary study as slight as can be conceived. But bones themselves are of unequal plasticity and (speaking in scale of plasticity) tend into horny parts (bill, feet, etc.). These horny features, solely because more plastic and thus less valuable than bones as a chronicle of anything previous to the moment of death, are a closer approach to pertinence as a basis of inference. But are far from a discriminating record of the subtle activities of life. Much more can be guessed of a bird's consciously metabolic character or psychologic detail from bill and feet than from bones; but this tends by the same causes to represent directly if one fact, then not any other; the subtler discrimination, because *in the chronicle fixed*, barring out the universality or continuity of living action. Whereas the bones in the main are a fair chronicle not of one's bird, but of generalities never actually contemporaneous with the bones, the bills and feet are less fair as any general chronicle and far more restricted as to what individuality they chronicle when regarded after death. But here arises the new correction that the bill and feet can almost as accurately be observed in life, where they serve not as a doubtful chronicle of limited groups of acts; but in interminable variety as features of a metabolic activity. To a keen sense for osteology even the bones in action (once their general sort be known) can be thus observed readily enough. And, if this be not with perfect precision, pray how else are they observed in action at all? But the feet and bill in action stare you in the face. Pace for pace as the ease of comparative observation in the life increases, decreases the value in the corpse for chronicle; as also increases the value in the life as metabolic subject-matter for science. Whereas there is ostensibly one set of bones through most of a bird's mature lifetime (I do not here object to the study of embryology), it begins to be evident that bill and feet live and die (i. e. grow and wear out and are renewed with differences) many times in a lifetime — the feathers more rapidly yet. And whereas the bones may be a tolerable chronicle of many ancestral lives and of the dead hand in the present specimen; or again, by minutest microscopy, may afford chronicle of some slight metabolism per se, the feathers are so metabolic as to be a chronicle of short life-periods only; at most and in the rough, the chronicle of a season, but on close examination hardly of a day. And their intense suggestion, by wear and tear, weathering, etc., of out-door activities, domestic economy, moults, whatnot psychologic of which they afford *only the most meagre temporary chronicle*, refers one at once to the necessity of a continual observation of the living bird[1] (barring comparison of *innumerable* specimens already condemned!) if one would understand the feather in the least. Which in turn shows us that it is by the living bird, his psychology, affections, matings, feedings, buildings, locomotions and whatnot that we even at all understand the bills, feet, wing-bones and general skeleton, which otherwise serve mechanics or geometry, not ornithology. So that the living bird is the thing, even for the wretchedly inadequate chronicle: which is better as a chronicle the less it refers to the actual killed bird at all!

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[1] All who themselves secure or require of others for verification such specimens; or editorially accept without explicit protest and publish without expressed disapproval record of such killing; actively encourage this preposterous method. The example to the general public with regard to popular offences against bird-life is the worst possible; and the tu quoque of those who earn bread and butter in bird slaughter is unanswerable.

To sum up, I have shown that the dead bird differs from the live bird as an object of science by being a chronicle which is the more pitifully insufficient, the more precise is its reference to the bird killed — of which it is always ostensibly the record; that it fails the worse as a record, the more precisely it refers to its fact. That any attempt at all to secure dead specimens of importance and interest to metabolic (non-generic or non-specific) ornithology involves the destruction of just those birds whose existence is important to the continued actuality of bird-life or the development of ornithologic subject-matter. That the attempt to secure adequate collections of such chronicles is self-defeating so long as a single bird remains alive. And would be, when complete, infinitesimal in accomplishment just in proportion as its records refer precisely to the birds killed, i. e. to an infinite (infinitesimally analyzable) bird-life at the instant of death only; and are otherwise increasingly generalized or dubious. I proved also that these conclusions all follow from the rejection of the theory that a bird flying out of doors is scientifically purely a sort-of-bird, and not a very bird at all. The theory itself I reduced to an absurdity in the proof that a type not constituted by and varying with its actual instances could not have any identifiable instances whatever, alive nor dead, neither known nor demonstrable; even a "mere unit"-instance per se defining its type by its own quality and characteristic of being one-of-an-aggregate.

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[1] A pioneer in any general field, like Dr. Dwight in Moulting, must needs have special license to kill, to which subsequent workers should never pretend. And the admission of any exception to the rule of life-study is liable to great abuse.

But ornithologists will doubtless continue just as before to kill for "scientific" purposes; and to be surprised if, by the cumulative effects of the subtraction of all "originals," eccentrics or geniuses, birds disappear, or, as far as this cause is concerned, tend to disappear with a rapidity out of all proportion even to the large numbers collected; and if the layman far less preposterously goes gunning for a living.

There are at present, more or less available for teaching, collections public and private, which if merged as wanted would be *far more* than ample for all reasonable mere classifications.[1] Let these be made available everywhere for ready reference as they are not at present, and all put under the charge of a single committee of the A. O. U.; let them be portable if necessary and varyingly distributed in proportion to teachers' needs. But let no ornithologist make the slightest pretence that they are the proper subject-matter of ornithology as a science. Let those ornithologists who have fortunately taken to bird-protection, stop excepting themselves for any purpose whatsoever from their sermons. Let all ornithologists, for purely scientific reasons, ostracize all who for any purpose of purely ornithological inquiry (unless they be pioneers with special license from their peers) kill a living bird. Let them, for science's sake, treat such a murder, as criminal curiosity whenever manifested deserves to be treated. And then, perhaps, birds and the science of birds will greatly increase. And the authorities on birds will not be known, as now too many are known, by the scalps they have "taken."

REGINALD C. ROBBINS.

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[1] Classification even tends of course modernly more and more to emphasize field-habits rather than mere structure: the latter receding into a comparative unimportance analogous to that of genealogy in sociological studies.

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